

# ACS EEx d/EEx de Collector Columns

*In the following pages we illustrate the ACS EEx Collector Columns, sold and serviced by the Cavotec Sales Companies and by a network of Cavotec Group Distributors.*

## The Cavotec Group

Cavotec is the name of a group of companies specialized in power supply technology for cranes and other industrial equipment. It is formed by 4 manufacturing "Centres of Excellence" located in Italy, Germany, France and Sweden and by 4 local manufacturing units located in Australia, China, Sweden and USA.

For distribution of their products and support to customers Cavotec has 18 sales companies which, together with a network of Distributors, serve more than 30 countries on five continents.

Each manufacturing company, no matter where it is located, aims at being a market leader in its field by providing innovative and reliable products to Group customers.

Although they manufacture different products in different countries, they are globally supported and coordinated by the Cavotec Group in their product development and marketing activities. Each sales company, and each distributor, has a policy aiming at better serving its local market with the full support of the Cavotec Group.

## Cavotec Sales Companies

The products manufactured by Specimas described in the following pages, as well as other quality products in the field of crane and power technology, are distributed around the world by the Cavotec sales companies and by a network of selected Distributors.

## Our aim is to be local everywhere

Great emphasis is put in providing the highest quality not only in the selected products, but also in service and backing to their customers. Our philosophy in fact is to be local everywhere.

## Our fields of activity are



**Mining,  
tunnelling**



**Steel Mills**



**Forestry**



**Ports,  
Terminals**



**Robots,  
Automation**



**Offshore  
Marine**

## ACS

ACS was established in 1950 in Oslo, Norway. In the beginning engineering and production of electromechanical products for the furnace industry, hydropower plants, cranes, large vessels etc. were its main activities.

Since the start of the exploration of the oil resources in the North Sea in the 1970's, focus has been more and more directed towards special products for the on- and offshore-based oil and gas industry. Design and manufacturing takes place at our premises in Oslo, Norway.

ACS products are designed to fulfil the NORSOK requirements and the EN norms. The Norske Veritas (DNV) and NEMKO certify the products.

ACS and the Daughter Company NECO OFFSHORE A/S are today recognised and certified supplier of following products for the oil and gas industry, ship builders, combined cycle power plants, mining, furnace industry etc.

- EEx de Collector Columns
- EEx de Magnetic Brakes
- EEx de Magnets
- EEx Junction boxes
- EEx and non EEx On and Offline Water Wash Systems for Gas Turbines.
- Firedampers certified by Norske Veritas
- EEx Special solutions
- Resistors

ACS has been working for more than 30 years with EEx products for the oil industry. Our products have proven to work well and are reliable. We have a broad range of standard Ex equipment. If the customer has a special need not covered by our standard products, we are prepared to design and manufacture products to fulfil his special requirements.

# Why use the ACS Collector columns.

ACS EEx collector columns are designed and approved in accordance with the European norms. EN 50014, EN 50018 and EN 50019. The units are certified by NEMKO (Norwegian Board for Testing and Approval of Electrical Equipment). ACS has thirty years of experience in manufacturing collector columns and our experienced engineers have continuously perfected and evolved our products in close cooperation with our customers.

ACS collector columns are installed on offshore cranes, cable reels, wind power mills and winches all over the world.

ACS collector columns have a robust design with a low weight. There is only one flameproof joint to be opened to get full access to the rings and the brushes. This minimizes the need for maintenance and service.

Units classified for gas group IIC require an "L shaped" flameproof joint. The design with only one flameproof joint makes the ACS collector columns very competitive when classification gas group IIC is required.

ACS collector columns are configured with rings for power, earth and signals according to customer's requirements. As an option the units can be equipped with pipe and swivel for transfer of gas or fluids across rotating interfaces.

ACS collector columns have different options for electrical connection.

- Flying leads, all cables connected in the factory according to customer's specification
- EExd glands for direct connection to rings and brushes.
- EExe junction boxes with cable glands and terminals.
- EExe junction boxes with MCT (Multi Cable Transits) and terminals.

ACS collector columns are painted according to the NORSOK Offshore standard. This makes the collector columns able to withstand extreme ambient conditions.



ACS S-10  
Collector column.



S-100 with standard slip ring body and flat flame proof joint for gas group IIA and IIB.

ACS collector columns can be manufactured in stainless steel (AISI 316L).

ACS collector columns can be equipped with a centre tube for hydraulic oil or air.

ACS collector column ACS-10 provides a free centre hole with a diameter of 200mm.

ACS collector columns are customized. Our engineers cooperate with the customer to meet the requirements with respect to ring configuration and Ex classification.

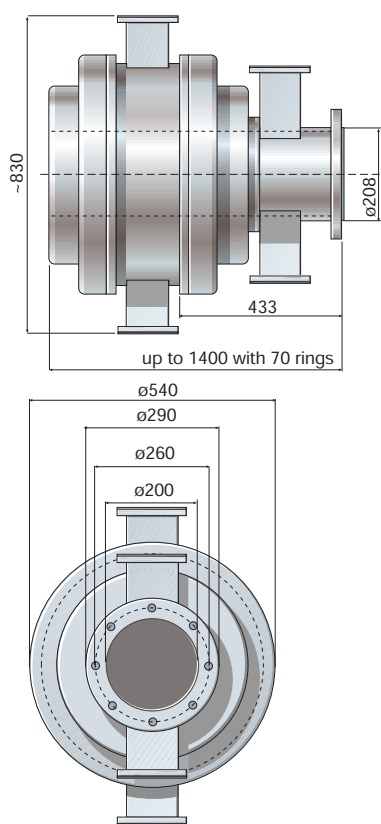
ACS collector columns are designed and manufactured at the same location. The engineers responsible for the design carefully supervise the production. Each unit is tested before shipment. The customer is welcome to inspect and witness the FAT.

# Collector Column EEx de Type ACS-10.

## Application

The ACS-10 slipring unit provides a Ø200mm free centre hole. This unit is normally used for small power and signal transmission on hydraulic cranes. It has also been used on loading booms for oil and gas. A high throughput current can be achieved by connecting rings in parallel. The ACS-10 unit has integrated EEx e junction boxes on both the ring and the brush side.

All EEx e junction boxes can be provided with the required number and sizes of EEx e cable glands. The ACS-10 unit can be equipped with up to 70 rings. This unit is suitable for vertical installation only. The mounting flange is located on the bottom of the ring side.



## Technical characteristics of ACS-10

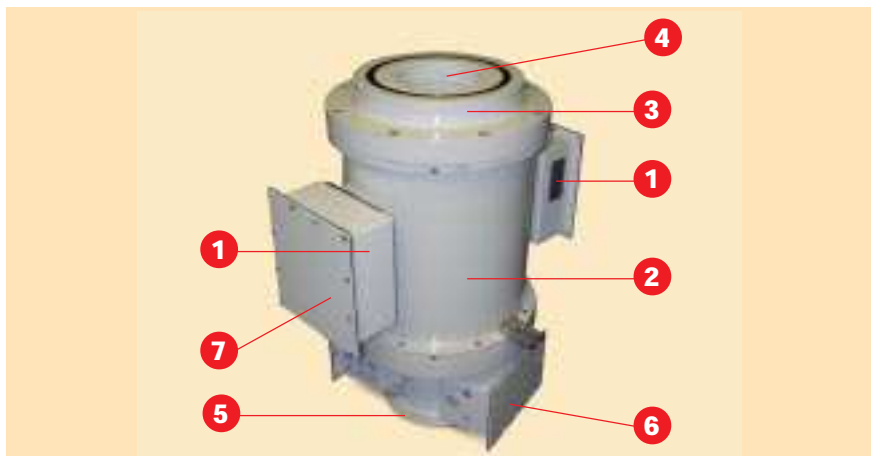
<b>Ex-code:</b>	EEx IIB T4
<b>Certificate:</b>	NEMKO Ex 92C400
<b>Configuration:</b>	Customized
<b>Max current:</b>	20 rings of 50A
<b>Max Voltage:</b>	660V
<b>IP-grade:</b>	IP 56
<b>Rings:</b>	Brass/copper alloy/silver-plated
<b>Brushes:</b>	Copper graphite/silver graphite
<b>Cable glands:</b>	EEx e cable glands max. M50 threads or Multi Cable Transit
<b>Housing:</b>	Painted steel
<b>Painting:</b>	According to offshore standard, NORSOK
<b>Junction boxes:</b>	Ring side: Integrated part of the unit in variable sizes Brush side: Integrated part of the unit in variable sizes
<b>Option:</b>	The whole unit made of stainless steel
<b>Heater:</b>	Available on request.
<b>Net weight:</b>	Approx. 450 kg

## Typical configuration:

Type	Number of rings	Power	Signals
ACS-10	40+PE	7 rings 50A/230V and 12 rings 10A/230V	21 rings 10A/24VDC
ACS-10	69+PE	12 rings 50A/230V and 19 rings 10A/230V	38 rings 5A/24VDC

Other configurations are available on request.

- 1 - Cable entry brush side
- 2 - Slipring body
- 3 - EEx d cover
- 4 - Ø200mm free centre hole
- 5 - Mounting flange
- 6 - EEx e junction Box ring side
- 7 - EEx e junction Box brush side



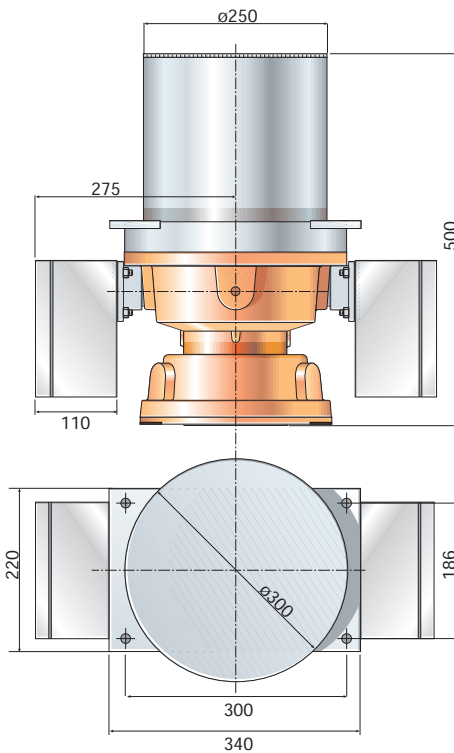
# Collector Column EEx de Type ACS-65.

## Application

The ACS-65 slipring unit is frequently used on motorized cable reels. It has also been installed on smaller cranes, rotating machinery and wind turbine. The ACS-65 unit can be equipped with two EEx e junction boxes in stainless steel on the brush side. On the ring side an integrated, brass junction box is standard. All EEx e junction boxes can be provided with the required number and sizes of EEx e cable glands.

The standard ACS-65 unit is delivered with 3 rings of 65A + PE and 6 rings for signals. The configuration of the ACS-65 can be customized with up to 9 rings of 65A/500V.

The unit can be mounted both horizontally and vertically. The mounting flange is located on the brush side.



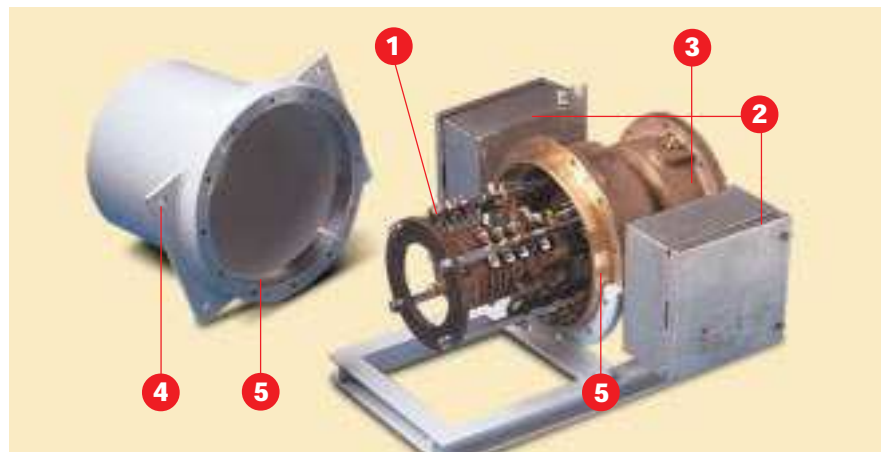
## Technical characteristics of ACS-65

<b>Ex-code:</b>	EEx de IIC T5
<b>Certificate:</b>	NEMKO 84.058
<b>Configuration:</b>	Standard or customized
<b>Max current:</b>	9 rings of 65A
<b>Max Voltage:</b>	500V
<b>IP-grade:</b>	IP 54
<b>Rings:</b>	Brass/copper alloy/silver-plated
<b>Brushes:</b>	Copper graphite/silver graphite
<b>Cable glands:</b>	EEx e cable glands can be provided, max. M50 threads
<b>Housing:</b>	Brass and painted/stainless steel
<b>Painting:</b>	According to offshore standard, NORSOK
<b>Junction boxes:</b>	Brush side: 2 pcs. standard 200x200x100mm made of stainless steel Ring side: 1 pcs. standard integrated Ø200x90 made of brass
<b>Option:</b>	Mounted on a frame with Cavotec Specimas 20 gearbox for motorized cable reels
<b>Heater:</b>	Available on request.
<b>Weight:</b>	Approx. 90 kg

## Typical configuration:

Type	Number of rings	Power	Signals
ACS-65	8+PE	4 rings 65A/415V	4 rings 10A/24VDC
ACS-65	11+PE	3 rings 65A/480V	8 rings 10A/110VAC

Other configurations are available on request.



- 1 - Slipring body
- 2 - EEx e junction Box brush side
- 3 - EEx e junction Box ring side
- 4 - Mounting flange
- 5 - Flameproof joint

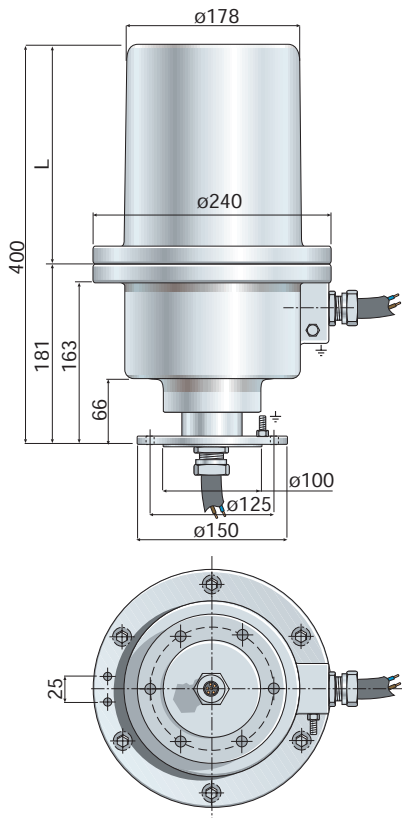
# Collector Column EEx d Type ACS-100 and ACS-100T.

## Application

The slipring unit is frequently used on smaller cranes, spring cable reels and rotating machinery. The standard unit is delivered with a housing made of cast alloy. This unit has one cable entrance on each side. The ACS-100 is delivered with EEx d-cable glands with. As an option the ACS-100 can be equipped with cables specified by the customer "flying leads". An EEx e junction box can be mounted on the brush side only.

The most used ACS-100 configuration is with 3 rings of 25A + PE. The configuration of the ACS-100 can be customized with up to 6 rings of 50A/660V.

As an option the unit can be delivered with a Ø12 centre tube, for air or hydraulic oil, with 1/2" NPT connection. The unit can be mounted both horizontally and vertically. Mounting flange is located on the ringside.



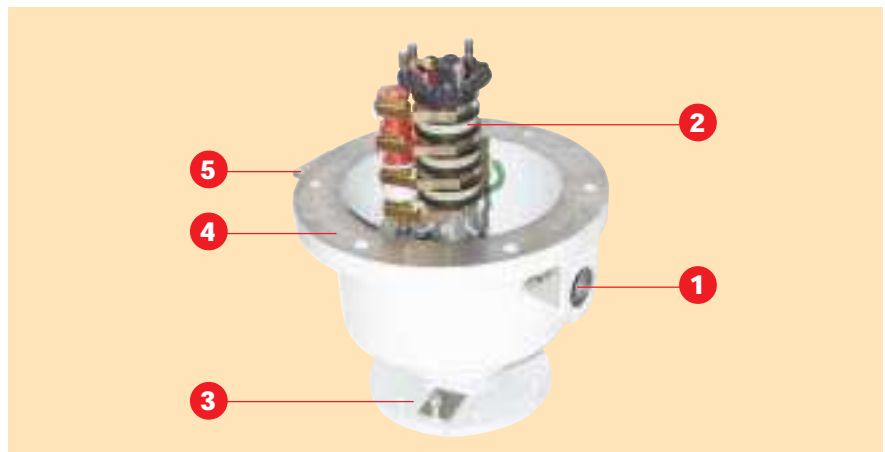
## Technical characteristics of ACS-100

<b>Ex-code:</b>	EEx d IIB T4
<b>Certificate:</b>	NEMKO Ex 92C400
<b>Configuration:</b>	Standard or Customized
<b>Max current:</b>	6 rings of 50A
<b>Rated Voltage:</b>	660V
<b>Protection grade:</b>	IP 56
<b>Rings:</b>	Brass/copper alloy/silver-plated
<b>Brushes:</b>	Copper graphite/silver graphite
<b>Connection ring side:</b>	One ingoing cable connected to connection board.
<b>Connection brush side:</b>	One outgoing cable connected to brushes, EEx e junction box available
<b>Cable glands:</b>	EEx d cable glands with or without flying leads, max. M32
<b>Housing:</b>	Painted cast alloy as standard
<b>Painting:</b>	According to offshore standard, NORSOK
<b>Option 1:</b>	Ø12 centre tube for air / hydraulic, 1/2" NPT connection
<b>Option 2:</b>	Longer cover $L_{max} = 490mm$
<b>Option 3:</b>	Without mounting flange
<b>Heater:</b>	Available on request
<b>Weight:</b>	Approx. 25 kg

## Typical configuration:

Type	Number of rings	Power	Signals
ACS-100	3+PE standard	3 rings 25A/660V	NA
ACS-100	6+PE	3 rings 25A/660V	3 rings 10A/24VDC
ACS-100	12+PE	3 rings 25A/415V	9 rings 10A/110VAC

Other configurations are available on request.



- 1 - Cable entry brush side
- 2 - Slipring body
- 3 - Installation flange
- 4 - Flameproof joint
- 5 - Torque link

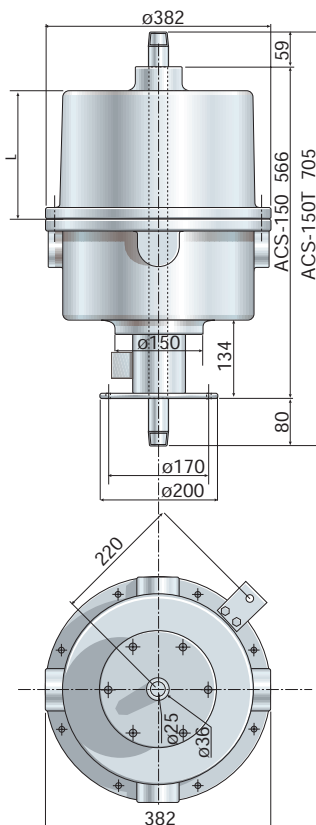
# Collector Column EEx d

## ACS-150 and ACS-150T with centre tube.

### Application

The ACS-150 slipring unit is frequently used on medium sized cranes. It has also been installed with motorized cable reels. The standard ACS-150 is delivered with a housing made of cast alloy. As an option the unit can be delivered with Ø36/25 centre pipe (ACS-150T), for air or hydraulic oil, with 1" NPT connection as standard. The unit has maximum four cable entrances on each side (2x 1" NPT threads is standard). The unit is delivered with EEx d-cable glands.

As an option the ACS-150 (T) can be equipped with cables specified by the customer (Flying leads). An EEx e junction box can be mounted on the brush side only. The standard ACS-150 unit is delivered with 3 rings of 25A/480V + PE and 20 rings of 10A for signals. The standard ACS-150T unit is delivered with 3 rings of 80A/660V + PE and 6 rings of 10A for signals. The configuration of the ACS-150 and ACS-150T can be customized with up to 6 rings of 150A/660V. The unit can be mounted both horizontally and vertically. The mounting flange is located on the ringside.



### Technical characteristics of ACS-150

<b>Ex-code:</b>	EEx d IIB T4
<b>Certificate:</b>	NEMKO Ex 92C400
<b>Configuration:</b>	Standard or Customized
<b>Max current:</b>	6 rings of 150A
<b>Rated Voltage:</b>	660V
<b>IP-grade:</b>	IP 56
<b>Rings:</b>	Brass/copper alloy/silver-plated
<b>Brushes:</b>	Copper graphite/silver graphite
<b>Connection ring side:</b>	Max four ingoing cables connected to connection board or directly to rings
<b>Connection brush side:</b>	Max four outgoing cables connected to brushes, EEx e junction boxes available
<b>Cable glands:</b>	EEx d cable glands, with or without flying leads, max. M50
<b>Housing:</b>	Painted cast alloy as standard
<b>Painting:</b>	According to offshore standard, NORSOK
<b>Option 1:</b>	Centre tube for air / hydraulic, 1" NPT connection
<b>Option 2:</b>	Longer cover than standard up to L max = 700mm
<b>Option 3:</b>	Mounted on a frame with Cavotec Specimas 20 gearbox for motorized cable reels
<b>Heater:</b>	Available on request
<b>Weight:</b>	Approx. 60 kg

### Typical configuration:

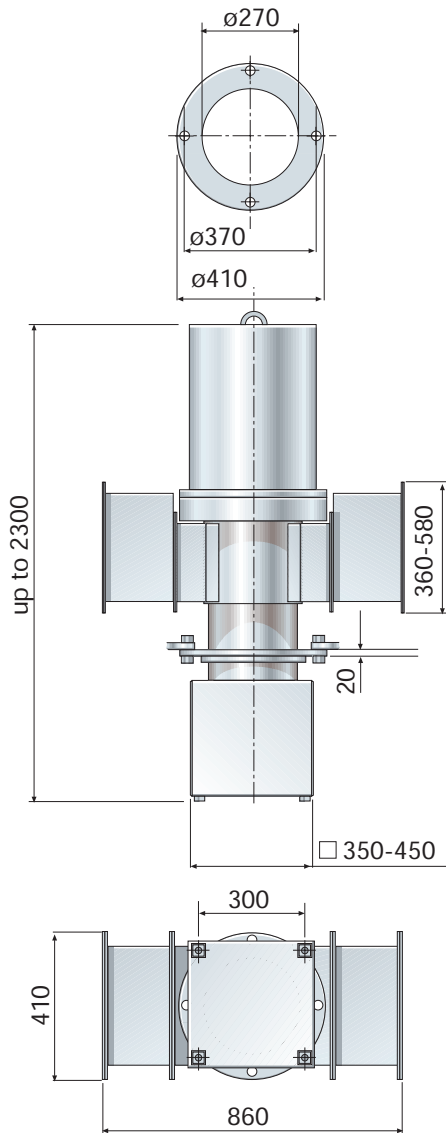
Type	Number of rings	Power	Signals
ACS-150	23+PE standard	3 rings 25A/480V	20 rings 10A/110V
ACS-150T	9+PE	3 rings 80A/660V	6 rings 10A/660V
ACS-150	15+PE	3 rings 90A/440V	12 rings 25A/440V

Other configurations are available on request.



- 1 - Slipring body
- 2 - Mounting flange
- 3 - Flameproof joint
- 4 - EEx d cable gland brush side
- 5 - Torque link

# Collector Column EEx de ACS-300 and ACS-300T with centre tube



## Application

The ACS-300 slipring unit is basically used for larger sized offshore cranes when there is a need for a transfer of medium power and signals.

The ACS-300 can be equipped with two integrated EEx e junction boxes on both the ring and the brush side. All EEx e junction boxes can be provided with necessary EEx e cable glands or frames for Multi Cable Transit (MCT).

The junction boxes vary in size according to current and amount of rings.

The flameproof joint is L shaped and the unit meets the requirements for IIC classification. The unit can be mounted both horizontally and vertically. The mounting flange is located on the brush side. This unit is always configured and built according to customer's requirement.

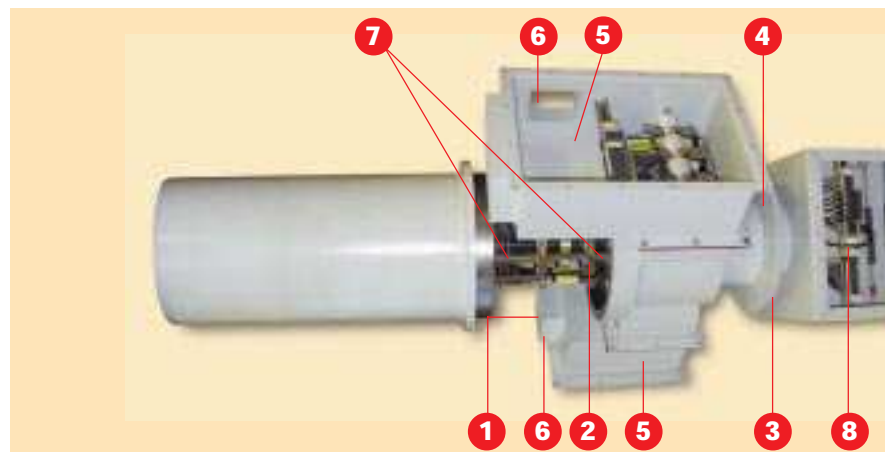
## Technical characteristics of ACS-300 and ACS-300T

<b>Ex-code:</b>	EEx de IIC T4 (EEx de IIC T6 for 3,3kV)
<b>Certificate:</b>	NEMKO 85.156
<b>Configuration:</b>	Customized
<b>Max current:</b>	12 rings of 210A at 690VAC
<b>Rated Voltage:</b>	Up to 3300VAC with 3 rings of 100A
<b>IP-grade:</b>	IP 56
<b>Rings:</b>	Brass/copper alloy/silver-plated
<b>Brushes:</b>	Copper graphite/silver graphite
<b>Cable glands:</b>	EEx e cable glands or Multi Cable Transit frames
<b>Housing:</b>	Painted steel
<b>Painting:</b>	According to offshore standard, NORSOK
<b>Junction boxes:</b>	Brush side: 2 pcs up to 580x410x200mm made of painted steel Ring side: 1 pcs up to 400x400x400mm made of painted steel
<b>Option 1:</b>	Centre tube for air / hydraulic, up to Ø85/75 mm
<b>Option 2:</b>	The whole unit made of stainless steel
<b>Heater:</b>	Standard 230VAC self regulated anti condensation heater, approx. 50W. Other types available
<b>Weight:</b>	Approx. 250-400 kg

## Typical configuration:

Type	Number of rings	Power	Signals
ACS-300 or ACS-300T	66+PE	6 rings 250A/690VAC and 16 rings 25A/415VAC	44 rings 10A/24VDC
ACS-300 3,3kV	44+PE	3 rings 100A/3300VAC and 7 rings 30A/415VAC	34 rings 10A/24VDC

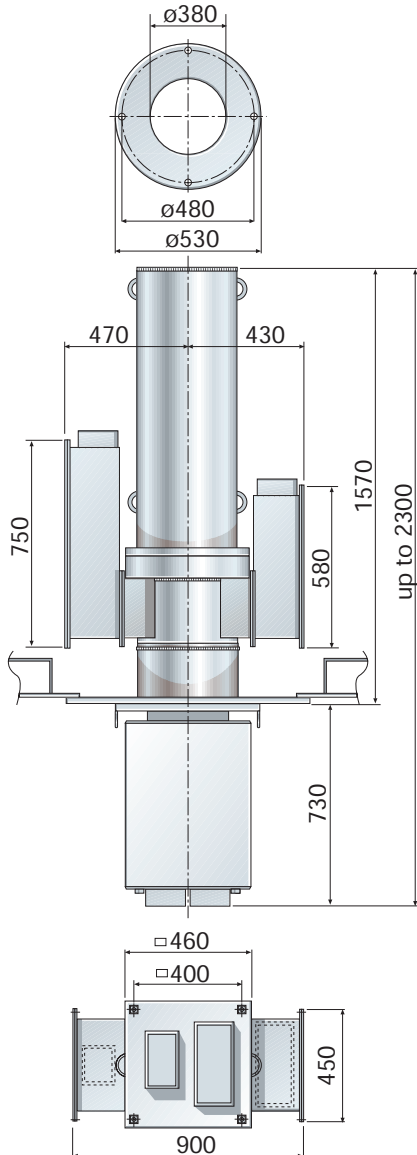
Other configurations are available on request.



- 1 - Cable entry brush side
- 2 - Slipring body
- 3 - Swivel point
- 4 - Mounting flange on brush side
- 5 - EEx e junction box brush side
- 6 - Multi Cable Transit frame (MCT frames)
- 7 - Flameproof joint
- 8 - EEx e junction box ring side



# Collector Column EEx de ACS-600 and ACS-600T with centre tube.



## Application

The ACS-600 slipring unit has a higher throughput current than the ACS-300. This unit offers a numerous combinations of rings for power and signals. The ACS-600 can be equipped with two integrated EEx e junction boxes on both the ring and the brush side. All EEx e junction boxes can be provided with necessary EEx e cable glands or frames for Multi Cable Transit (MCT). The junction boxes vary in

size according to current size, type of signals and amount of rings. The flameproof joint is L shaped and the unit meets the requirements for IIC classification. The unit can be mounted both horizontally and vertically. The mounting flange is located on the brush side. This unit is always configured and built according to specifications given by the customer.

## Technical characteristics of ACS-600 and ACS-600T

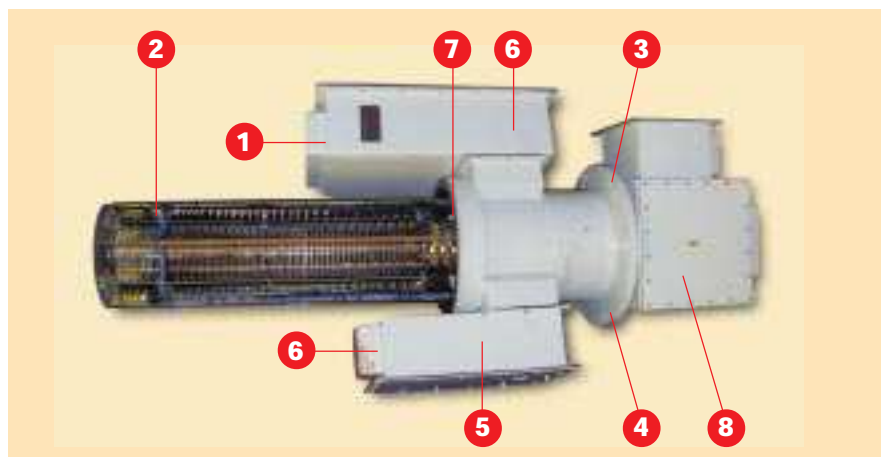
<b>Ex-code:</b>	EEx de IIC T5/ EEx de IIC T4
<b>Certificate:</b>	NEMKO 85.156
<b>Configuration:</b>	Customized
<b>Max current:</b>	10 rings of 410A (T5) or 12 rings 600A (T4) at 690V
<b>Rated Voltage:</b>	Up to 690V
<b>IP-grade:</b>	IP 56
<b>Rings:</b>	Brass/copper alloy/silver-plated
<b>Brushes:</b>	Copper graphite/silver graphite
<b>Cable glands:</b>	EEx e cable glands or Multi Cable Transit frames
<b>Housing:</b>	Painted steel
<b>Painting:</b>	According to offshore standard, NORSOK
<b>Junction boxes:</b>	Brush side: 2 off up to 750x480x210mm made of painted steel Ring side: 1 off up to 450x450x620mm made of painted steel
<b>Option 1:</b>	Centre tube for air / hydraulic, up to Ø 85/75 mm
<b>Option 2:</b>	The whole unit made of stainless steel
<b>Heater:</b>	Standard 230VAC self regulated anti condensation heater, approx. 100W. Other types available
<b>Weight:</b>	Approx. 350-500 kg

## Typical configuration:

Type	Number of rings	Power	Signals
ACS-600 or ACS-600T	71+PE	6 rings 400A/690VAC+PE 21 rings 25-50A/415VAC	33 rings 10A/24VDC 10 rings silver for IS

Other configurations are available on request.

- 1 - Cable entry brush side
- 2 - Slipring body
- 3 - Swivel point
- 4 - Mounting flange on brush side
- 5 - EEx e junction box brush side
- 6 - Multi Cable Transit frame (MCT frames)
- 7 - Flameproof joint
- 8 - EEx e junction box ring side

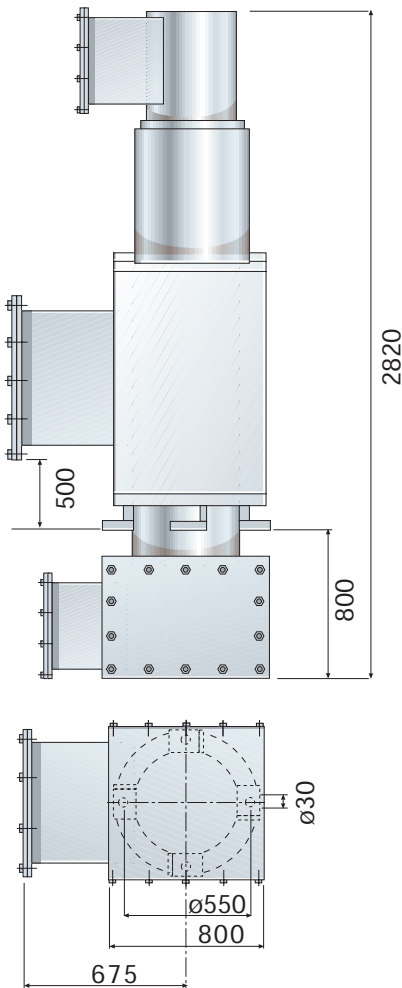


# Collector Column Type ACS-2000.

## Application

This is the largest standard slipring unit in the ACS programme of EEx de Collector Columns. The unit has been installed on very large offshore cranes. The ACS-2000 is equipped with integrated EEx e junction boxes on both the ring and the brush side. All EEx e junction boxes can be provided with necessary EEx e cable glands or frames for Multi Cable Transits (MCT).

The junction boxes vary in size according to current and amount of rings. Centre tube for transfer of air or oil can be installed as an option. The flameproof joint is L shaped and the unit meets the requirements for IIC classification. The unit can be mounted both horizontally and vertically. The mounting flange is located on the brush side. This unit is always configured and built according to customer's requirement.



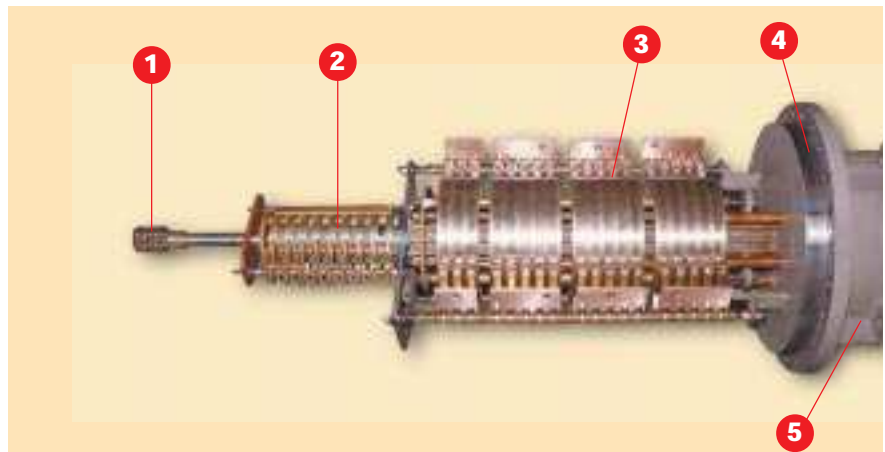
## Technical characteristics of ACS-200

<b>Ex-code:</b>	EEx de IIC T4
<b>Certificate:</b>	NEMKO 85.004 X
<b>Configuration:</b>	Customized
<b>Max current:</b>	2000A
<b>Rated Voltage:</b>	Up to 660V
<b>IP-grade:</b>	IP 56
<b>Rings:</b>	Brass/copper alloy/silver-plated
<b>Brushes:</b>	Copper graphite/silver graphite
<b>Cable glands:</b>	EEx e cable glands or Multi Cable Transit frames
<b>Housing:</b>	Painted steel
<b>Painting:</b>	According to offshore standard, NORSOK
<b>Junction boxes:</b>	Customized
<b>Heater:</b>	Standard 230VAC self regulated anti condensation heater, approx. 100W. Other types available
<b>Weight:</b>	Approx. 1500-1800 kg

## Typical configuration:

Type	Number of rings	Power	Signals
ACS-2000	21+PE	3 rings 2000A/660VAC+PE 8 rings 125A/415VAC	10 rings silver for IS

- 1 - Sliprings for IS - circuits
- 2 - Sliprings for aux. power
- 3 - Sliprings for main power
- 4 - L-shaped flameproof joint
- 5 - Mounting lugs



# Applications.

## List of customers

Molde Cranes  
Hydralift  
TTS-Aktro  
TTS-Norlift  
Konecranes  
Favelle Favco  
KENZ cranes  
Atlas Copco MCT  
AmClyde  
Applied Hydraulics  
American Aero Cranes  
Titan  
Seatrax  
National Oilwell  
North American Cranes  
Spanco  
Laiding  
Krupp  
Storhert & Pitt  
Bailey Technogroup  
Proven Engineering  
Weather Ford



*ACS EEx slipring assemblies are often used for rotating applications onboard production platforms.*



*Electrical Assembly of S-600.*



*S-300 made of 100%  
Stainless Steel AISI 316L.*

**Cavotec Group  
Headquarters**

**The Netherlands**  
Cavotec Group Holdings N.V.  
Postbus 213  
NL-2950 AE Alblasserdam  
phone: int. 31-78-693 0794  
fax: int. 31-78-693 1212

**U.K.**  
Cavotec International Ltd  
Stirling Way, Market Deeping  
Lincolnshire PE6 8AS  
phone: int. 44-1778.346 769  
fax: int. 44-1778.341 850

For more information consult  
our home page on the Internet:  
**www.cavotec.com**  
E-commerce sites:  
**www.cavotecshop.com**  
**www.flexiblecables.com**

**Cavotec Group  
Manufacturing Companies**

**Australia**  
Cavotec Metool  
Cardiff (Newcastle)  
Perth

**China**  
Cavotec China  
Shanghai

**France**  
Cavotec RMS  
Cergy Pontoise (Paris)

**Germany**  
Cavotec Alfo  
Overath (Köln)

**Italy**  
Cavotec Specimas  
Nova Milanese (Milan)

**Sweden**  
Cavotec Connectors  
Dalby (Malmö)  
Cavotec Sverige  
Haninge Stockholm

**U.S.A./Canada**  
Cavotec Inc.  
Statesville, NC

**Cavotec Partners**

Brevetti Stendalto  
Morza, Italy

De Jong  
Leerdam, The Netherlands

Micro-control  
Stjørdal, Norway

Pirelli Cavi  
Milan, Italy

**Cavotec Group  
Sales Companies and Distributors**

**Argentina**  
Cavotec Latin America  
Buenos Aires

**Australia**  
Cavotec Metool  
Cardiff (Newcastle),  
Brisbane, Sydney, Perth,  
Melbourne

**BeNeLux**  
Cavotec Benelux  
Alblasserdam (Rotterdam)  
The Netherlands

**Brasil**  
Marlin Gantrex  
Rio de Janeiro

**Chile**  
Gantrex  
Santiago

**China**  
Cavotec China  
Shanghai

**Denmark**  
Cavotec Danmark  
Odense

**Egypt**  
Ase, Cairo

**Finland**  
Cavotec Finland  
Espoo (Helsinki)

**France**  
Cavotec RMS  
Cergy Pontoise (Paris)

**Germany**  
Cavotec Alfo  
Eschborn (Frankfurt)

**Hong Kong**  
Cavotec Hong Kong  
Shatin

**Indonesia**  
Cavotec Indonesia  
Jakarta Utara

**Italy**  
Cavotec Italia  
Nova Milanese (Milan)

**Japan**  
Nippon Ican  
Tokyo

**Korea**  
Cavotec Korea  
Ulsan

**Norway**  
Cavotec Norge  
Drammen

**Saudi Arabia**  
AKTE  
Dammam

**Singapore**  
Cavotec Singapore  
Singapore

**South Africa**  
Gantrex  
Germiston

**Sweden**  
Cavotec Sverige  
Stockholm

**Taiwan**  
Ehrung Industrial  
Taipei Hsien

**U.A.E.**  
Cavotec Middle East  
Dubai,  
Abu Dhabi,  
Bahrain

**U.K. & Ireland**  
Cavotec UK  
Market Deeping

**U.S.A. & Canada**  
Cavotec Inc.  
Statesville, NC



**OS-KOM spol s r.o.**  
Zdíkovská 22, 150 00 Praha 5  
tel./fax : 00420-257 210 114  
oskom@oskom.cz  
www.oskom.cz  
CZECH REPUBLIC